

Brief Note

The Arterial Blood Ketone Body Ratio in Chronic Liver Diseases -with Special Reference to the Effect of TAE

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Key words : arterial ketone body ratio — TAE — chronic liver diseases

It is well known that hepatic mitochondrial function plays a major role in the hepatic functional reserve.¹⁻³⁾ We measured the arterial blood ketone body ratio in chronic liver diseases as a marker of hepatic mitochondrial function. Changes in the ketone body ratio before and after transcatheter arterial embolization (TAE) in liver cancers were also examined.

Fifteen controls and 43 cases of chronic liver diseases, consisting of five cases of chronic hepatitis, seven of cirrhosis of the liver, two of alcoholic liver disease and 29 of liver cancer, were examined. Arterial blood and heparinized blood were taken two hours postprandially. In TAE cases, the blood was collected five times; before, immediately after, 5 hours, 12 hours and 24 hours after TAE. Measurement of the ketone body ratio was done by ketorex® (SANWA KAGAKU KENKYUSHO CO., LTD.) according to the method of Williamson.⁴⁾ The ketone body ratio was expressed as the ratio of acetoacetate/ β -hydroxybutyrate.

The arterial ketone body ratios in various liver diseases are shown in Fig. 1. The ketone body ratio was 2.76 ± 1.76 in normal controls, while it

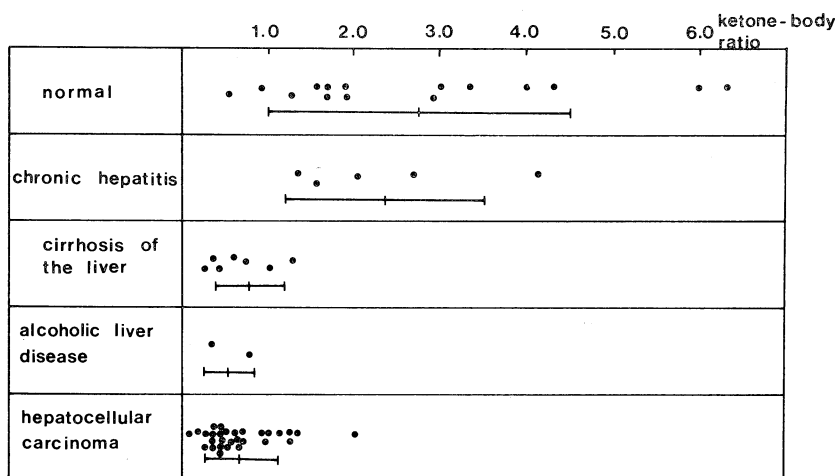


Fig 1. Ketone body ratio in chronic liver diseases

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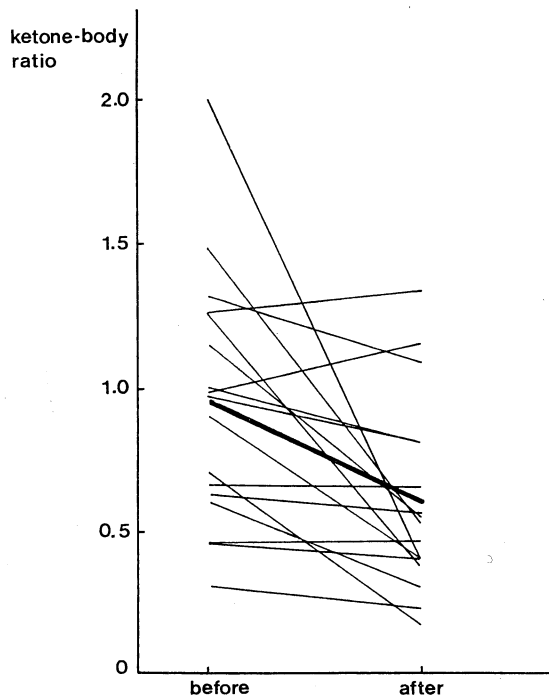


Fig 2. Ketone body ratio before and after TAE in hepatocellular carcinoma

was slightly decreased to 2.36 ± 1.15 in chronic hepatitis cases. Cirrhosis of the liver and liver cancer, it was significantly decreased to 0.81 ± 0.41 and 0.68 ± 0.42 , respectively. In alcoholic liver disease, it was also markedly decreased to 0.56 ± 0.30 . The arterial blood ketone body ratios before and after TAE in 17 cases of hepatocellular carcinoma (HCC) are shown in Fig. 2, the ketone body ratio before TAE was 0.95 ± 0.44 , and it decreased to 0.60 ± 0.33 immediately after TAE. The time course of the ketone body ratio in TAE, indicated that in effective TAE cases it decreased transiently, but it recovered 24 hours after TAE. In poor prognosis cases, on the other hand the ratio continued to decrease even after 24 hours. These results suggest that measurement of the ketone body ratio is useful in judging the prognosis after TAE. Ozawa *et al.*¹⁻³⁾ reported that the arterial blood ketone body ratio reflected mitochondrial function and was useful in the evaluation of hepatectomy in liver cancer. Ozawa *et al.*¹⁻³⁾ also reported that hepatic resection in HCC was safe and a good prognosis was indicated if the ratio exceeded 0.4. In our TAE cases, the same results were obtained. The ketone body ratio also decreased in cirrhosis of the liver and alcoholic liver disease, perhaps due to increasing energy consumption and the lack of substrate as well as to dysfunction of the mitochondria.

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